gMUC User Manual

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List of changes since the last version

Version	Date	Who	Chapter	Changes since the last version
1.00	20.07.2010	HKE		Created
2.00	30.08.2010	HKE		-RS232 Interface support -DynDNS configuration / Examples -STUN interval
	08.03.2011	JSC		Details Learn mode
3.00	02.09.2011	HKE		Push
	19.09.2011	JSC		Details Learn mode
	01.10.2011	JSC	3.6	Details Interface configuration
3.10	11.11.2011	HKE	3.7	MODBUS support
3.21	12.03.2012	RGR		-support wMBus Mode S -check WAN connectivity (Ping)
4.00	23.10.2012	RGR	3.5	gMUC V2 M-Bus configuration
4.01	15.11.2012	GEX	3.6	gMUC Interface configuration
4.50	29.04.2013	HKE	8	Automatic meter configuration and activation
4.52	16.12.2014	IKE	3.5,3.6, 3.8	MODBUS-SLAVE extension
4.52	19.01.2015	IKE	3.10,3.11	wMBUS Status and “CHANGED” Logger extension

1 INTRODUCTION

This manual explains the options for configuring a gMUC. The parameters for the gMUC are set using a web configuration. You require the use of a browser (e.g. Internet Explorer). A secure connection (https) to the configuration interface is set up in the address bar in the browser. The default IP address is set to *192.168.186.10*. The username is *admin*, the password is *admin*.
→ (i.e. https://192.168.168.10).

Once you have registered, the following start screen will appear:

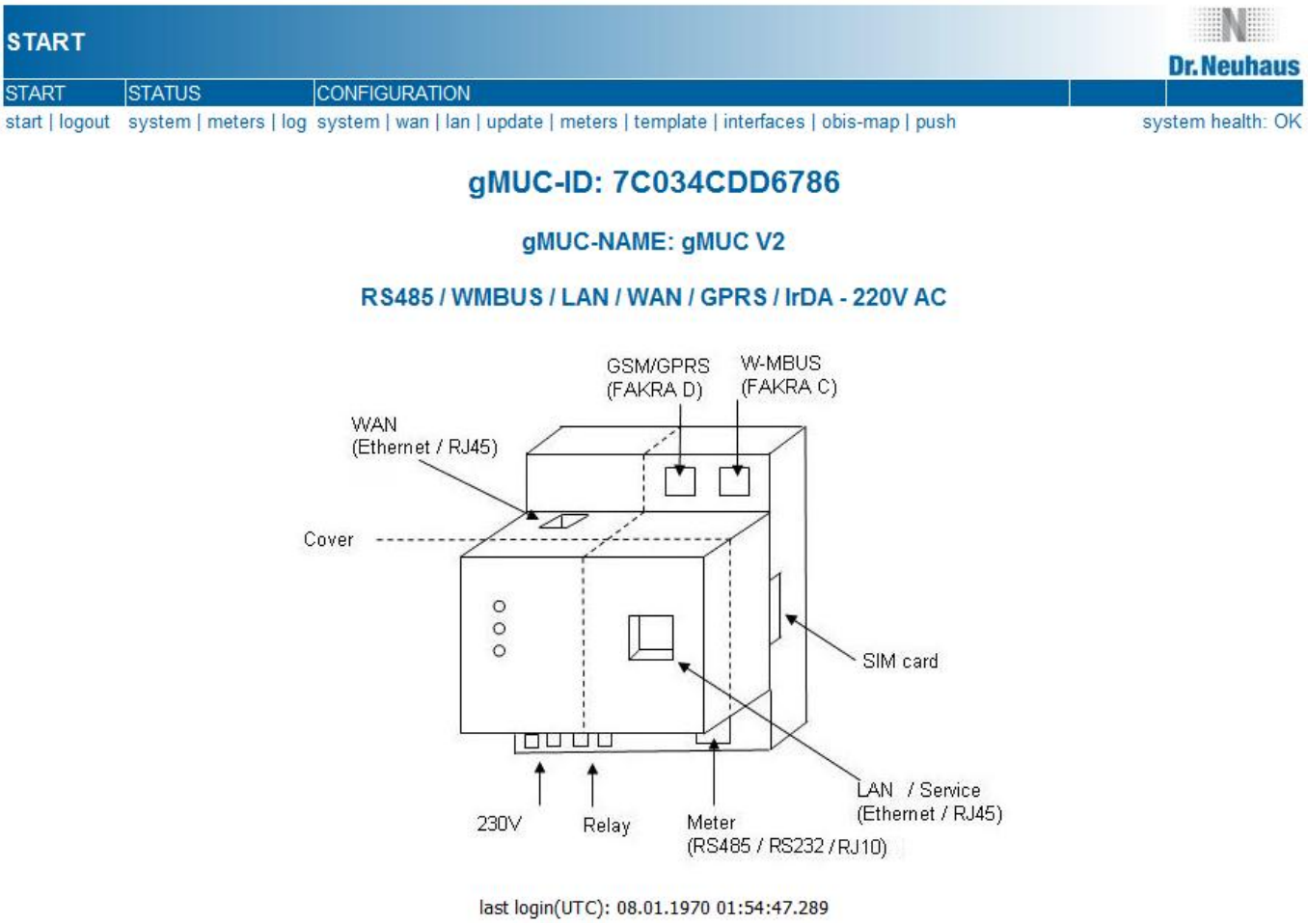


Figure 1: Start screen

The start screen shows the explicit gMUC ID and the existing hardware options for the gMUC. All external interfaces are labeled on the illustration.
At the top edge of the screen, you will find the configuration menu, which will be explained in more detail in the following. The chapters after that are based on the menu structure. The entire web configuration was created in English.

2 STATUS

The Status section provides information on the current status of the gMUC. It cannot be altered[1]. The information available includes status variables, the meters available and the log.

2.1 System

This indicates the internal status variables that are currently set in the system. These are system-specific and service-specific variables the number of which depends on the operating mode used (GPRS, DSL) and the hardware.

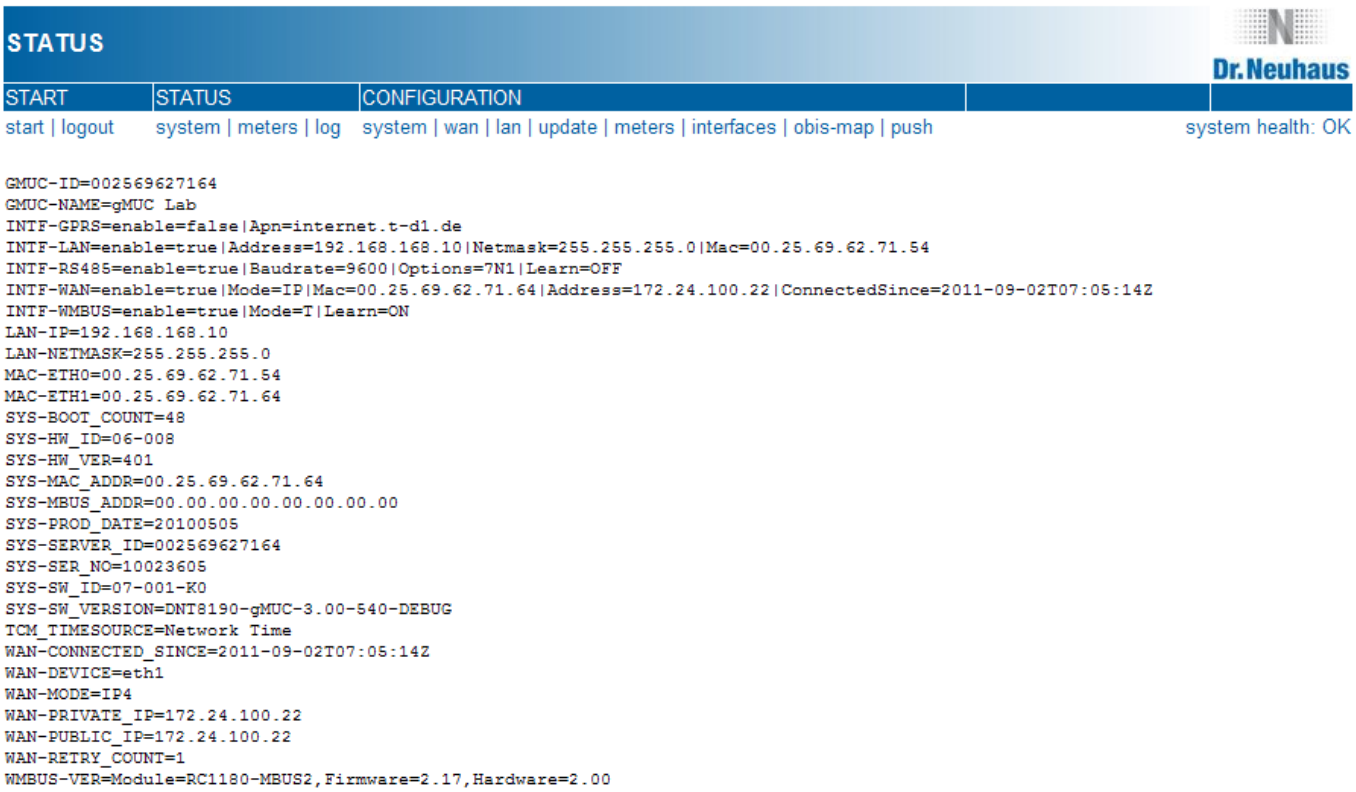


Figure 2: Status - System

[1] To alter the parameters, see Chap. 3

2.2 Meters

This screen shows a list of the available meters. Further details on the meter are also shown for each entry (address, measured variables, etc.).
Before the values from one of the meters are recorded by the gMUC, that meter has to be activated – to do so, click the button marked ‘Activate”, which appears if the meter is not yet registered in the gMUC.
For W-MBUS meters, the W-MBUS identifiers are mapped on standardized OBIS numbers in the gMUC. If this mapping process is incomplete or defective for a meter, this will be displayed on the screen. The mapping then has to be adjusted accordingly in the gMUC. If the meter data received from a W-MBUS meter is encrypted, the meter must first be activated (click ‘Activate’), and then store the corresponding AES key in the configuration of the meter (Chapter 3.5).

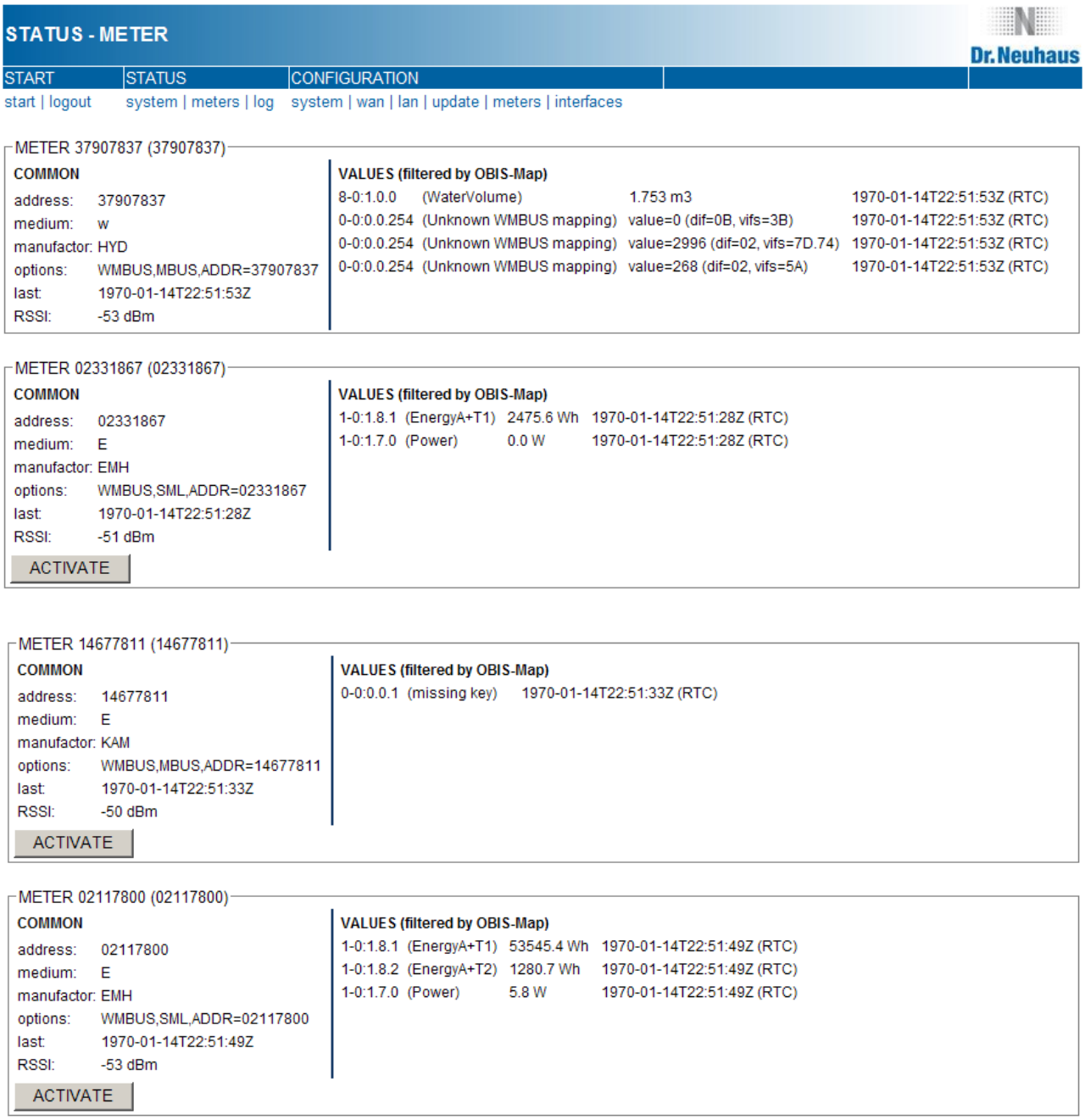


Figure 3: Status - Meter

2.3 Log

The operating events generated in the system are stored in a log, which can be read out on this screen. Among other things, it provides information on any errors that have occurred and system messages. Click the button marked ‘Delete’ to permanently delete the information currently in the log.

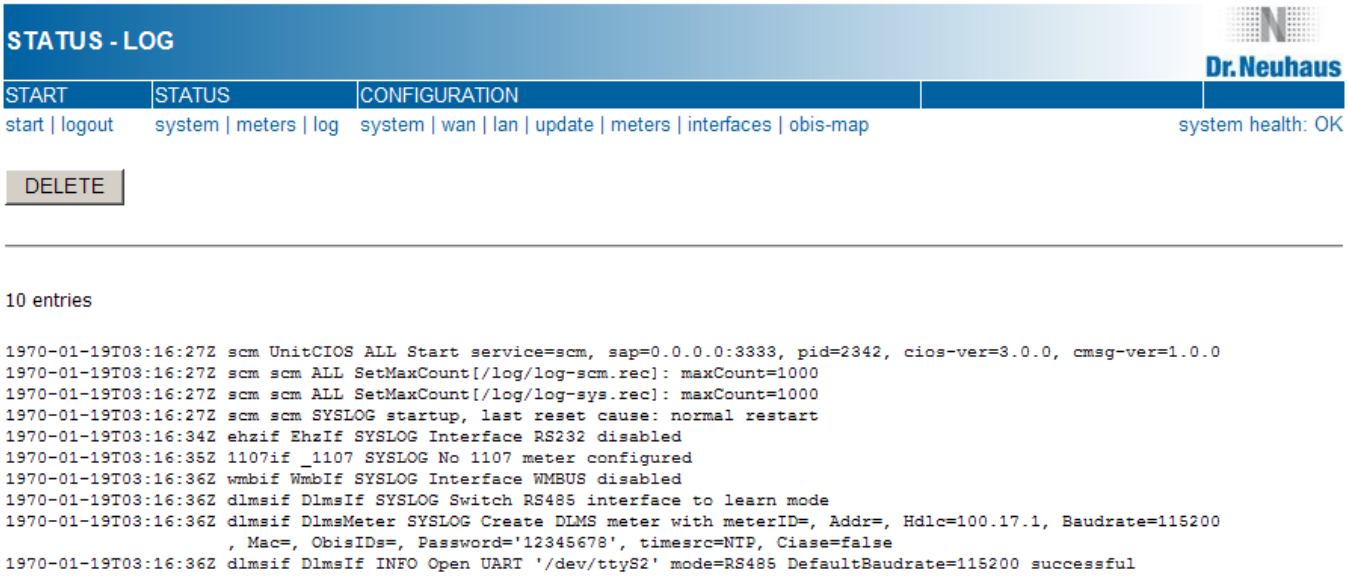

STATUS - LOG
Dr. Neuhaus
START
STATUS
CONFIGURATION
start | logout
system | meters | log
system | wan | lan | update | meters | interfaces | obis-map
system health: OK
DELETE
10 entries
1970-01-19T03:16:27Z scm UnitCIOS ALL Start service=scm, sap=0.0.0.0:3333, pid=2342, cios-ver=3.0.0, cmsg-ver=1.0.0
1970-01-19T03:16:27Z scm scm ALL SetMaxCount[/log/log-scm.rec]: maxCount=1000
1970-01-19T03:16:27Z scm scm ALL SetMaxCount[/log/log-sys.rec]: maxCount=1000
1970-01-19T03:16:27Z scm scm SYSLOG startup, last reset cause: normal restart
1970-01-19T03:16:34Z ehzif EhzIf SYSLOG Interface RS232 disabled
1970-01-19T03:16:35Z 1107if _1107 SYSLOG No 1107 meter configured
1970-01-19T03:16:36Z wmbif WmbIf SYSLOG Interface WMBUS disabled
1970-01-19T03:16:36Z dlmsif DlmsIf SYSLOG Switch RS485 interface to learn mode
1970-01-19T03:16:36Z dlmsif DlmsMeter SYSLOG Create DLMS meter with meterID=, Addr=, Hdlc=100.17.1, Baudrate=115200
, Mac=, ObisIDs=, Password='12345678', timesrc=NTP, Ciase=false
1970-01-19T03:16:36Z dlmsif DlmsIf INFO Open UART '/dev/ttyS2' mode=RS485 DefaultBaudrate=115200 successful

Figure 4: Status - Log

3 CONFIGURATION

The section on Configuration explains how to configure the parameters for the gMUC.

3.1 System

The System screen can be used to alter the registration information (username / password) for the web configuration. The gMUC system time (UTC) is set here and you can also trigger a restart of the gMUC.

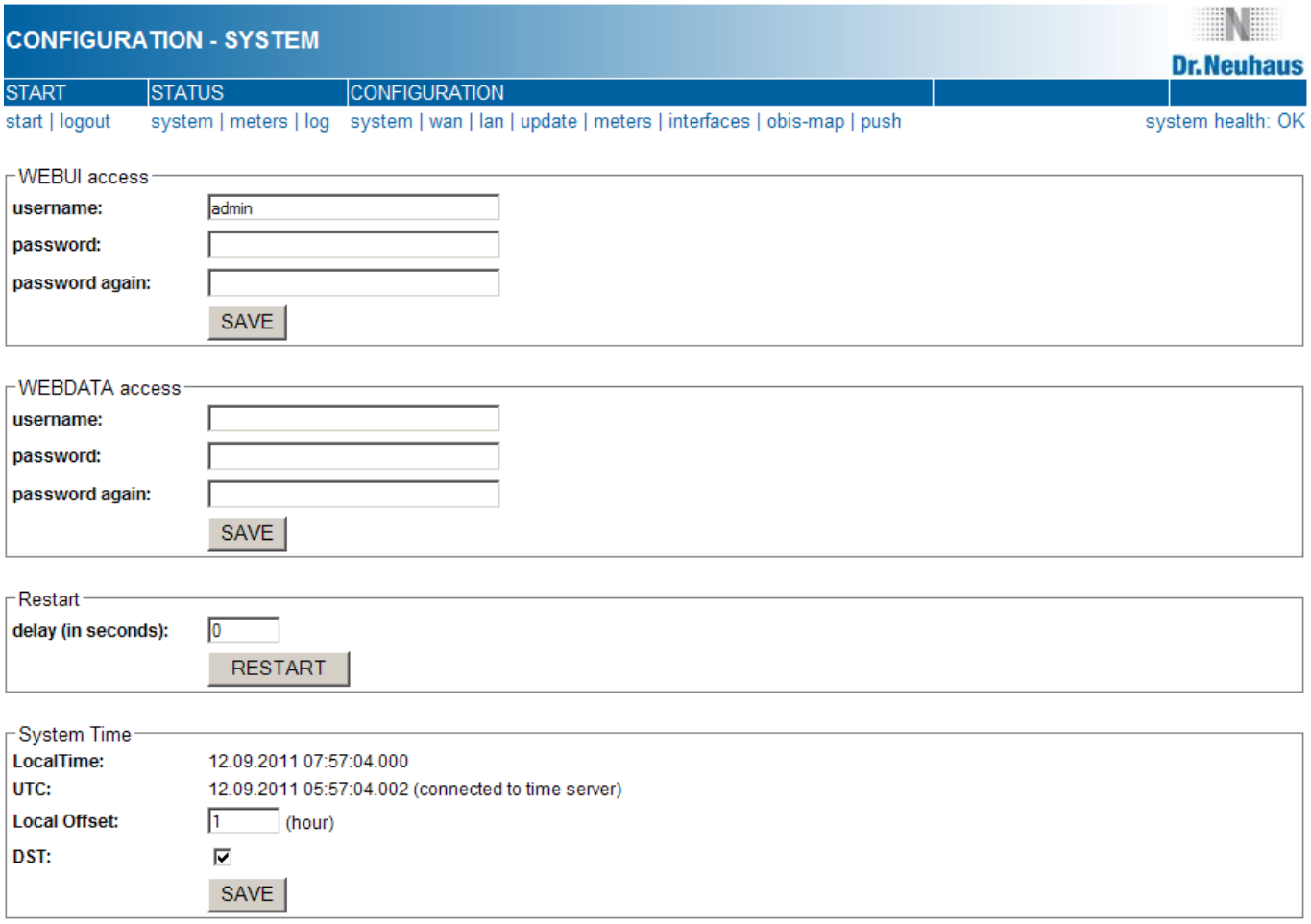


Figure 5: Configuration – System

WebUI access configured the client authentication (HTTP Digest) for the WAN interface. If no user/password assigned, the client side authentication is disabled.

With the button "Restart", a system reboot will be initiated gMUC

In the section "System Time", the system time of the gMUC can be called/changed. If the time is synchronized by a NTP time server, the field is disabled. The value "local offset" indicates the time offset of the current time zone in which the gMUC is in hours (time difference from UTC). The automatic use (switching) from summer / winter time can also be switched on / off.

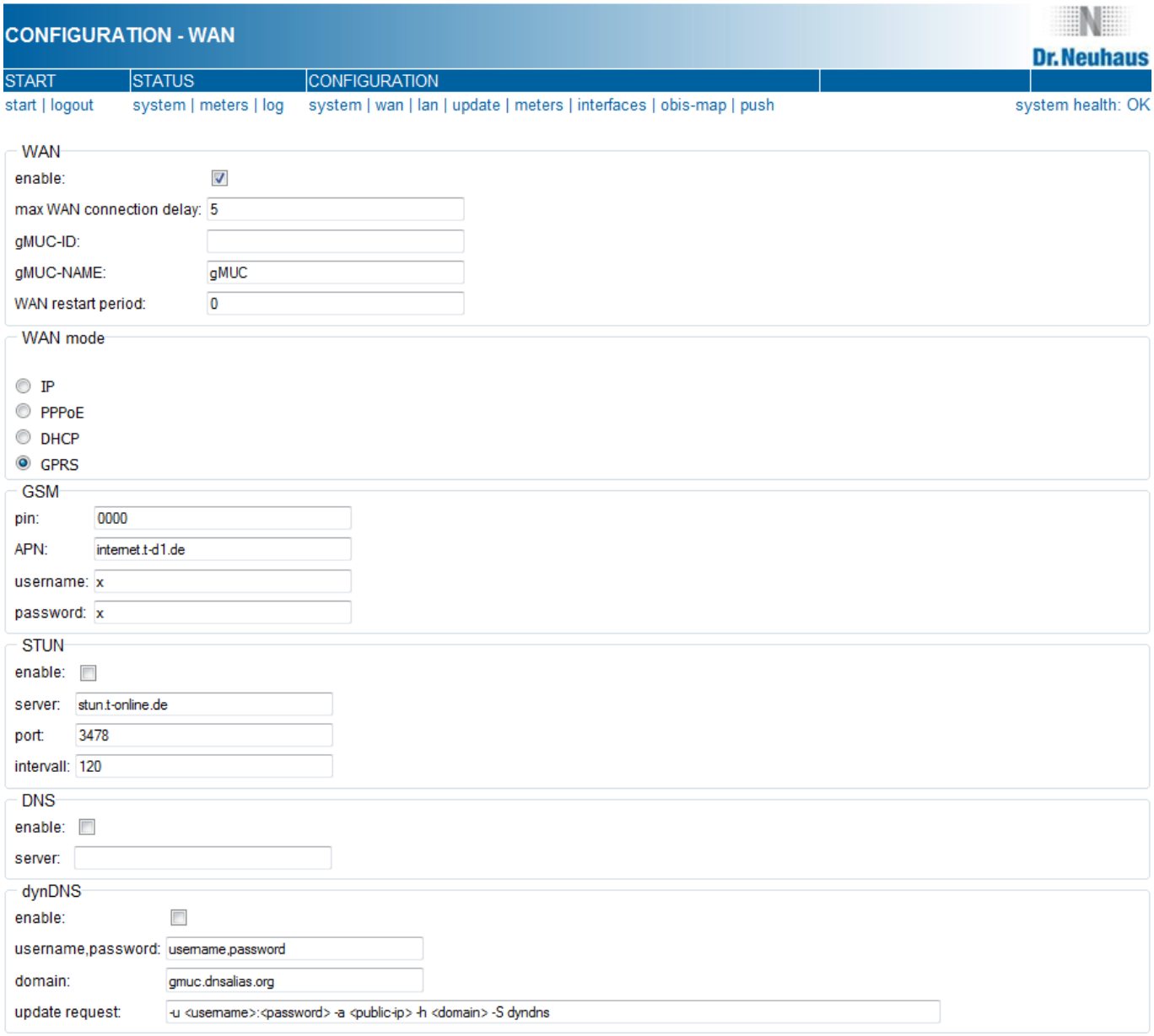
3.2 WAN

This screen is used to configure the WAN (**W**ide **A**rea **N**etwork) interface for the gMUC. Before you can use the WAN interface, it has to be activated. The WAN interface is always the rear Ethernet RJ45 jack on the gMUC.

The following general parameters are available:

- **Max WAN connection delay**
  - Maximum connection delay to start the WAN interface in seconds
  - In this way, the load can be distributed during a startup for the operation of a large number of gMUCs.
- **gMUC ID**
  - The ID of the individual gMUC to differentiate between the different devices
  - If the gMUC ID is left blank (default), the MAC address in Hex notation without the dots will be used automatically as the ID
- **WAN restart period**
  - Time in seconds after which the WAN interface is restarted cyclically (default: 0 = off)

There are four different ways in which the device can be reached via WAN:
→ **IP, PPPoE, DHCP and GPRS.**



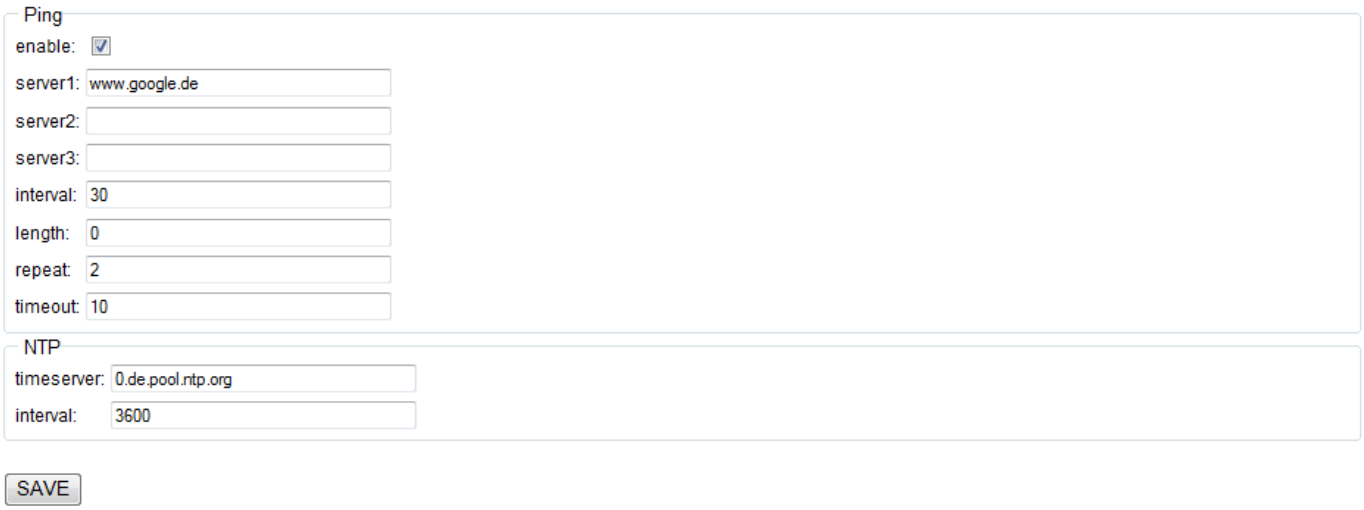


Figure 6: Configuration – WAN

- **IP**
  - In this case, the gMUC can be given a fixed static IP address, at which it can be reached in the WAN network (e.g. Internet/Intranet).
  - As a rule, this configuration is used for testing only.

- **PPPoE**
  - This option is used to configure a PPPoE dial-up onto the Internet using DSL technologies.
  - The username and the password for DSL access must be stored here.
  - The gMUC must be connected to a DSL modem with its WAN interface.

- **DHCP**
  - In this operating mode, the gMUC is operated on an existing DSL router.
  - The router performs the DSL dial-up itself and has to be configured as the DHCP server.
  - The gMUC then serves as the NAT client “behind” the router and gets its IP parameters (IP address, DNS, etc.) via the DHCP protocol from this router.
  - It is not necessary to configure special parameters in the gMUC.
  - The gMUC must be connected to the router with its WAN interface.

- **GPRS**
  - This option is used for the configuration of a GPRS dial-up on the Internet.
  - The gMUC must have a valid SIM card; the SIM-card parameters (PIN, username, password) must be configured accordingly.
  - The network operator’s APN (Access Point Name) also has to be entered.

Other general configurations are optional …

- **STUN**
  - If a STUN server is configured, the public IP address of the DSL connection can be identified.
  - This is useful in the DHCP operating mode in particular, in which case the public IP address of the DSL router is required. A time interval can be configured (in seconds) where he periodically STUN server is queried, which is necessary if the public Internet can change address (forced separation in DSL access)

- **DNS**
  - This is where you can configure a static DNS server for an Internet name resolution.
  - As a rule, this only makes sense in the IP operating mode because the DNS server is configured automatically in the system in all the other cases (PPPoE, DHCP, GPRS).

- **DynDNS**
  - This is where you can configure a DynDNS Internet service.
  - This makes it possible to address the gMUC under a fixed symbolic, non-ambiguous name on the Internet instead of using the device’s IP address, which can change under certain circumstances (e.g. new Internet dial-up).
  - The configuration parameters depend individually on the DynDNS service used.
  - The following placeholders are available to define a DynDNS **update** r**equest** in general:
  - The update request cannot contain any "".

Placeholders	Meaning
<username>	DynDNS username
<password>	DynDNS password
<gmuc-id>	gMUC ID
<domain>	DynDNS domain
<public-ip>	Public Internet IP address (e.g. assigned via PPPoE or STUN)
<private-ip> or <local-ip>	Local IP address (e.g. assigned via fixed IP4 or DHCP)

Example of registration with the "**dyndns.com**" provider

username,password:
bba@neuhaus.de,technik12345

domain:
gmuc.dnsalias.org

update request:
-u <username>:<password> -a <public-ip> -h <domain> -S dyndns

Example of registration with the "**no-ip.com**" provider

username,password:
bba@neuhaus.de,technik12345

domain:
002569627165.no-ip.org

update request:
-u <username>:<password> -a <public-ip> -h <domain> -s dynupdate.no-ip.com -S dyndns -g /nic/update?username=<username>&password=<password>&hostname=<domain>&myip=<public-ip>

- **Ping**
  - to check the IP connectivity, servers can be configured to be pinged at configurable intervals
  - up to three servers are adjustable
  - **interval** defines the period in seconds, a server is pinged
  - **length** defines the length of the payload
  - **repeat** defines the number of retries after an unsuccessful ping attempt
  - after **timeout** seconds a ping request have to be acknowledged
  - after Retrying **repeat +1** times on every configured server the WAN connection will be restarted
  - the WAN restart period is random between 1 s and 60 s
  - a repeating disconnect of the WAN connection because of an unsuccessful ping session results in doubling the WAN restart period
  - once the WAN restart period is higher than 3600 s, the increasing is stopped

- **NTP**
  - The NTP protocol is used to synchronize the gMUC time.
  - It is possible to enter the NTP server and the interval, in which a synchronization process takes place.
  - As a rule, the gMUC uses UTC (Universal Time Coordinated) time internally.

Remark

In the Group 'NTP', the NTP servers are specified, and the interval at which a synchronization is performed.
The set NTP period cannot be set exactly to any second, but only on powers of two.
$2^4 = 16$, $2^5 = 32$, $2^6 = 64$, $2^7 = 128$, $2^8 = 256$, $2^9 = 512$, $2^{10} = 1024$, $2^{11} = 2048$, $2^{12} = 4096$ ... 2^{17}
The gMUC completes the calculated power, i.e. be set to 2048 sec 3600 sec (34min). The next highest value is 4096 seconds (68 min). The maximum value is 2^{17} seconds. If it is determined that the system time is stable, the round trip time is automatically increased by the NTP service → NTP standard algorithm. The NTP service regulates the system clock and ensures that no time jumps occur due to the synchronization!

3.3 LAN

This screen is used to configure the data for the service interface (front Ethernet interface). The IP address and the network mask can be configured. The service interface is a prerequisite for web access. The default setting for the IP address is configured to 192.168.168.10.

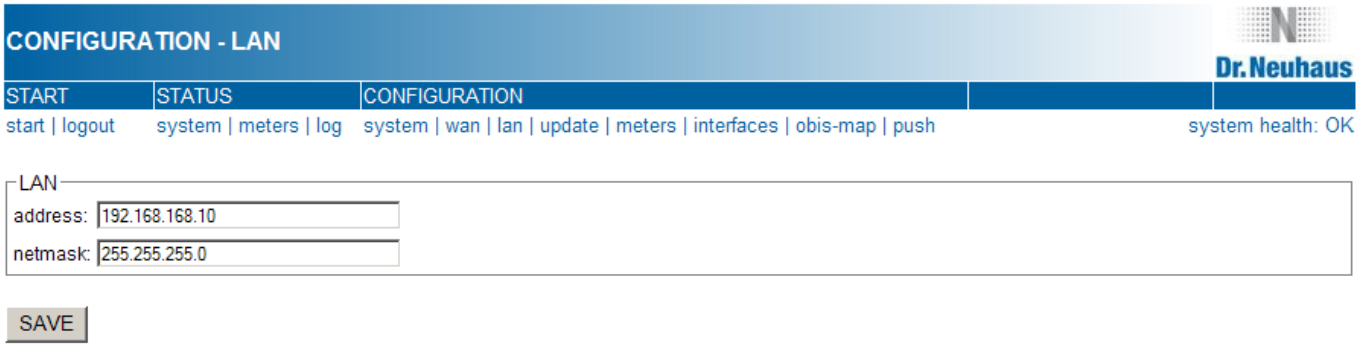


Figure 7: Configuration – LAN

3.4 Update

Updates are available for the firmware on the gMUC. This is done in two steps:
Upload and activate the firmware. The firmware versions already loaded onto the device will also appear on the list. A total of up to three different firmware versions can be stored on the device.
The firmware version that initially comes with the device cannot be overwritten or deleted. The user can choose from between two versions by activating the desired version.

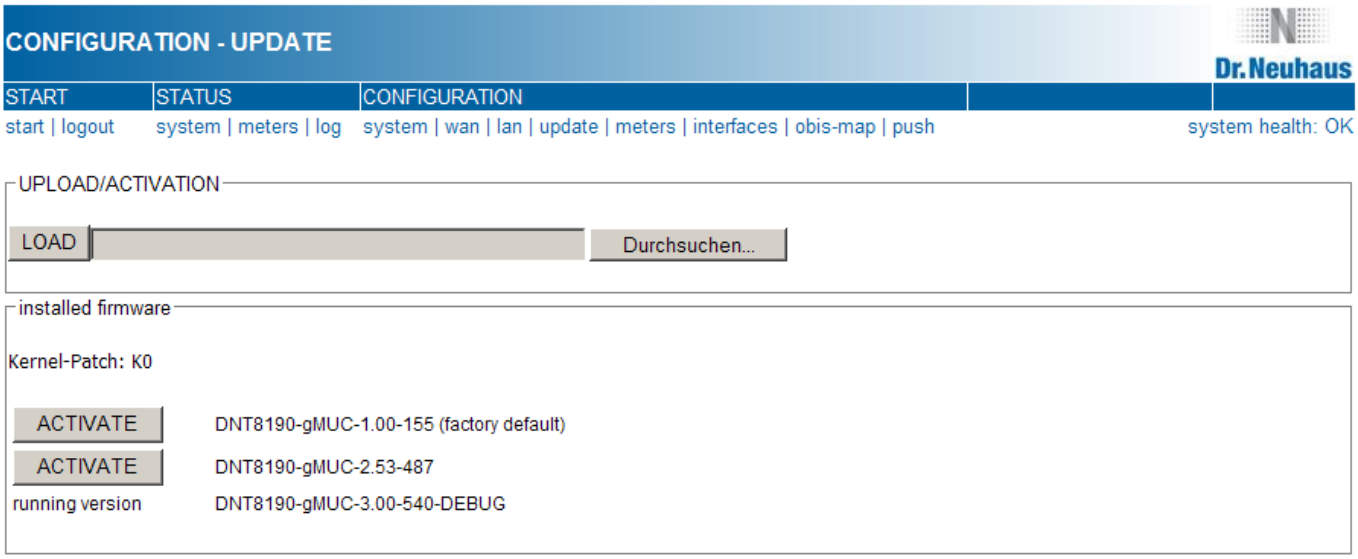


Figure 8: Configuration - Update

3.4.1 Uploading the firmware

To upload a new firmware program onto the device, you must select a firmware file delivered by the manufacturer on the input screen. Once the file has been selected, the upload process must be started.

Once the upload has been successfully completed, the new firmware version will appear on the list of firmware versions. Should an error occur, an error message will appear on the screen.

The firmware that was uploaded is now available on the device and ready for activation.

Up to two individual firmware files can be uploaded.

3.4.2 Activating the firmware

After the new firmware has been uploaded, it is still inactive – the previous version is the one that is active.

If you want to activate the new firmware, you have to click the corresponding 'Activate' button in the list to replace the previous version with the newly activated one. The system will be restarted automatically.

This completes the activation process. The previous version of the firmware will remained stored on the device and can be reactivated at any time.

Only one version of the firmware can be active at any one time. Once the firmware has been activated, the gMUC will not be available again until the restart has been completed.

3.5 Meter

This is the screen you use to add meters and to configure meters that have already been activated (cf. Chap. 2.2).

The following information must be provided for new meters only:

- the identification of the meter (meter ID)
- the medium recorded (short form)
- the manufacturer (short form)
- configuration parameters (interface, protocol, technical bus-address, special interface parameter)

The following information can also be included for new and existing meters:

- the interface via which the meter can be reached
- a key for the secure connection to the meter (optionally in Hex notation e.g. 01.02.03……..)
- one or more loggers, which describe the measurements recorded

Several loggers can be added to a meter, configured and also removed from the meter. The following values must be entered for a logger:
- the logger name (the following are already predefined: 15m, 1d, 1h, 1m, 1mon)
- the logger time interval (the following are defined: MINUTE, 15 MINUTE, HOUR, DAY, WEEK, MONTH, YEAR)
- the max. size (number of entries) for the logger
- the OBIS ID for the measurement to be recorded
- the PUSH parameters

The following parameters are valid for **options**:

Interface name:	RS485, RS232, WMBUS
Protocol:	1107, SML, MBUS, DLMS, MODBUS
Baudrate:	Baudrate=300[,600,1200,2400,9600,19200,38400,57600,115200]
Timesource:	NTP,meter
ADDR:	xxxxxx (e.g. RS485 bus address, WMBUS-MeterID, MODBUS address)
Sensor:	[1..64]

Example: RS485,1107,Baudrate=300,NTP,ADDR=00000001
Example: WMBUS,MBUS,ADDR=38000226
Example: RS232,SML,Baudrate=9600,meter,ADDR=01A815671833020102
Example: RS485,DLMS,Baudrate=115200,NTP,Hdlc=100.17.1,Password=12345678
Example: RS485,MODBUS,ADDR=2,Baudrate=9600,Register0=HR:0:uint16,Register1=HR:1:uint16

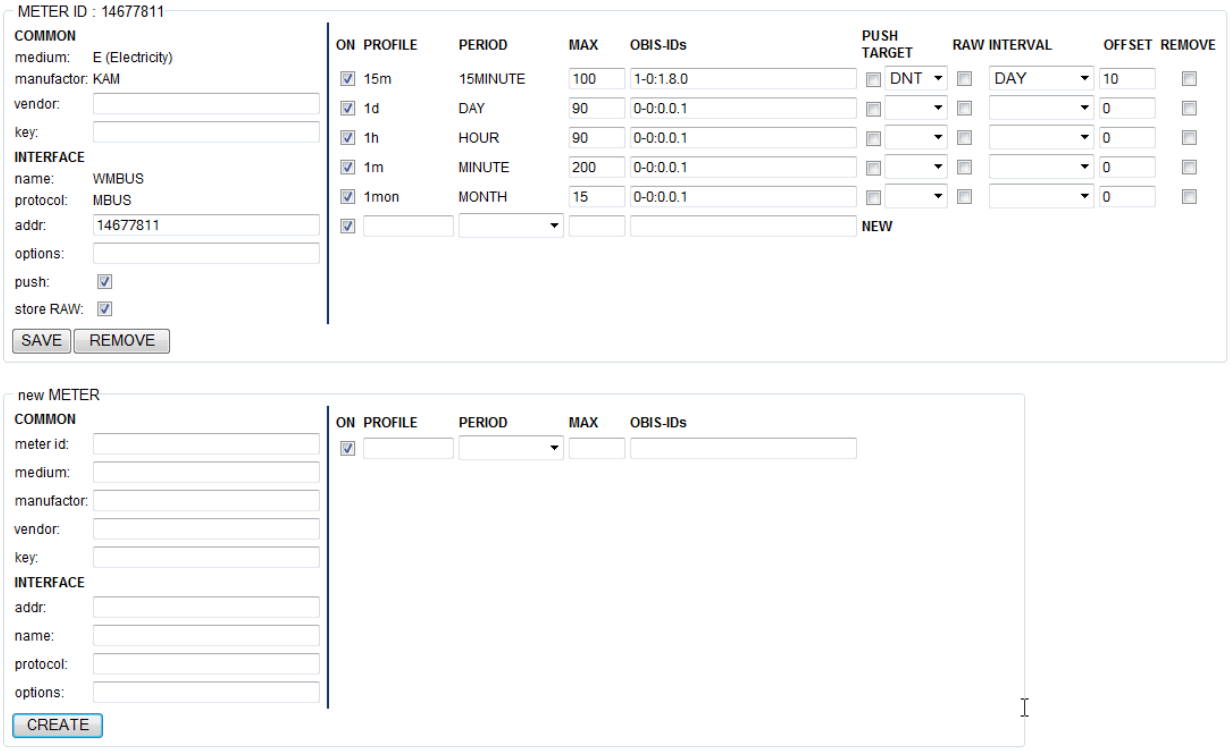


Figure 9: Configuration – Meter

3.5.1 Special Notes for the configuration of a MBUS meter

The protocol MBUS requires MUS V2 and additional hardware.

The MBUS specification defines two types of addressing a meter. primary addressing and secondary addressing. Most meters support both types. MUS V2 supports only secondary addressing.

To configure MBUS meter the secondary address (4 bytes – BCD encoded) have to be specified in parameter ADDR.

The secondary address corresponds to the serial number printed on the meter. Leading zeros have to be filled up to a size of 8 digits. When using secondary addressing the following three parameters have to be correct: secondary address, medium, meter software version (0-255).
In case of unknown parameter, placeholder can be used.
- secondary address: FFFFFFFF
- medium: X (intern 0xFF)
- meter software version: keep empty or 255 (decimal representation)

Every meter responses, whose own parameters matches with configured ones.

For example, a meter with the data

- secondary address: 2547659
- baud rate: 2400
- meter software version: 0
- number of responses: 1

is configured as followed:

Baudrate=2500,Version=0,Responses=1

Some meters responses with more than one messages. To get additional responses the optional parameter Responses have to configured. The default setting is Responses=1. The number of responses a meter provided, can be found in the datasheet. Commands send to a meter, will not be responded in the same way for different meters. The optional parameter OPTIONS handle those deviations.

OPTIONS value	**definition**
01	Meters do not response on an init command (i.e. Carlo Gavazzi Controls (EM33-DIN)). With OPTIONS=01 such meters are requested correctly.
02	Some Meters responses with large data packets (i. e. Landis+Gyr (UH50-A38C-DE00-B)) A configured baud rate less than 2400 baud results in a timeout. With OPTIONS=02 the timeout is increased for the specific meter.

The Elster MBUS PR6 meter responds to the command SND_NKE whether this meter has been addressed or not. Meters that can provide more than one responses, require the command SND_NKE. Consequently the simultaneous operation of a meter, that provides more than one response, and the PR6 module does not work reliably. Alternatively, meters have to be configured with Responses=1 to work in combination with a PR6 module.

3.6 Interfaces

The Interfaces screen lists the meter interfaces available on (RS485 / WMBUS[2]). Additional options can be indicated for each of these interfaces.

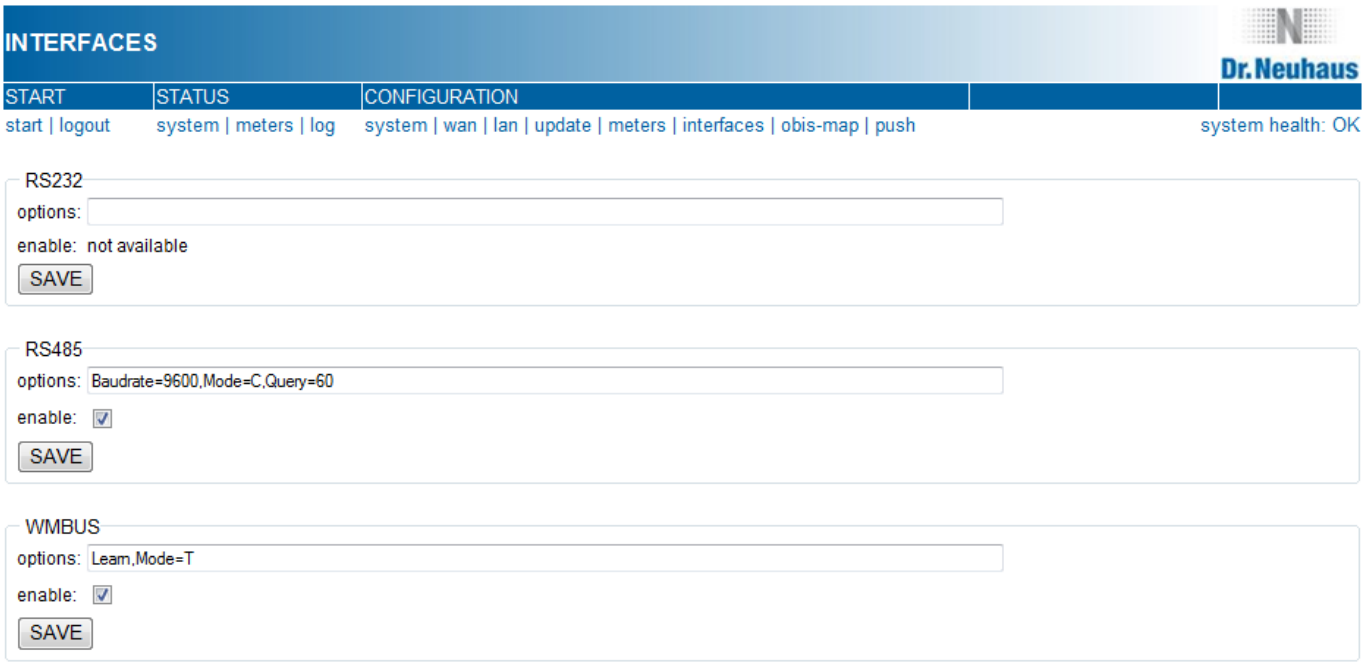


Figure 10: Configuration - Interfaces

The options provided for an interface must be separated from each other by commas.
Possible options include:

Interface type	Option	Meaning
RS485 RS232	Learn=1107 Learn=SML Learn=DLMS	Automatic recognition of inactive meters with indication of the protocol: 1107 = Recognition of 1107 meters on the RS485 SML = Recognition of SML meters on the RS485 / RS232 DLMS = Recognition of DLMS meters on the RS485
	Baudrate=xx	Speed of the interface in baud in Learn Mode; for 1107 meters, this is the starting baud rate (300, 1200, 2400,….)
	Query=xx	Query interval in seconds (only multiples of 60 seconds allowed)
	Password=xx	Password (ASCII) when using DLMS meter
	Hdlc=xx.yy.zz	HDLC address when using DLMS meter (default 100.17.1)
	Mode=	D = mode D when using 1107 meter C = mode C when using 1107 meter (default) Ciase = when using Sagem/DLMS meter MODBUS-SLAVE when using gMUC as slave for Modbus
	Password=	Meter password when using DLMS meter
	Register0..n=	Dataregister definition when using MODBUS sensor
	SlaveAddr=xx	[00..FF] gMUC Slave address used in Modbus-Slave mode
	Format=xxx	[7N1..8N1] Uart Format used in Modbus-Slave mode
WMBUS	Learn	Automatic recognition of inactive WMBUS meters The protocol (MBUS or SML) of the payload is automatically recognized by the WMBUS and does not have to be entered.
	Mode=	T = wMBus module works in T-Mode (default) S = wMBus module works in S-Mode
MBUS	Baudrate=xx	Speed of the interface in baud (300,600,1200,2400,4800,9600)

[2] Wireless M-Bus

	Responses=xx	Number of MBus responses on a meter request default: Responses=1
	OPTIONS=xx	optional MBus parameter to control protocol exceptions

Example configurations

meter typ	**meter options**	**Interface options**
1107 to RS485	RS485,1107,ADDR=12345678,Baudrate=9600,Mode=C	Query=60
SML to RS232	RS232,SML,ADDR=12345678,Baudrate=9600	
DLMS to RS485	RS485,DLMS,ADDR=12345678,Hdlc=100.17.1,Baudrate=115200,Password=xxxxx	Query=60
DLMS/**Sagem** an RS485 (with Discovery)	RS485,DLMS,ADDR=12345678,Mode=Ciase,Baudrate=9600,Password=xxxx, Hdlc=100.17.1	Query=60
WMBUS	WMBUS,MBUS,ADDR=12345678	
MODBUS to RS485	RS485,MODBUS,ADDR=1,Baudrate=19200, Register0=IR:0:floatinverse, Register1=IR:2:floatinverse	Query=60

3.7 MODBUS

The query of certains registers of a MODBUS sensor must be configured in the meter options using the parameters *Register0..n=function:address:format*:

- Query function (HR - holding register, IR - input register)
- Register start-address (integer)
- Register data format (uint16, uint32, float, floatinverse)

Syntax: **Register[0..n]=function[HR,IR]:address:format**
Example: *Register0=HR:0:uint16,* Query of the holding register with start adrdess 0, data format integer
Example: *Register1=IR:2:floatinverse,* Query of the input register with start address 2, data format floatinverse

complete meter options for the query of two registers:
RS485,MODBUS,ADDR=1,Baudrate=19200,Register0=IR:0:floatinverse,Register1=IR:2:floatinverse

The registers must be mapped in the OIDMAP (chapter 6) to the Obis numbering system.

METER ID=PZ72L

COMMON	
meter id:	PZ72L
medium:	x
manufactor:	Acrel
options:	RS485 MODBUS ADDR=2 Baudrate=9600 Register0=HR:0:uint16 Register1=HR:1:uint16
last:	2011-11-11T15:12:03Z

VALUES			
10-0:33.8.0	Voltage	22.87 V	2011-11-11T15:12:03Z (Network Time)
10-0:33.8.1	Current	1 A	2011-11-11T15:12:03Z (Network Time)

METER ID=THP21SL

COMMON	
meter id:	THP21SL
medium:	x
manufactor:	TONGDY
options:	RS485 MODBUS ADDR=1 Baudrate=19200 Register0=IR:0:floatinverse Register1=IR:2:floatinverse
last:	2011-11-11T15:12:04Z

VALUES			
10-0:34.8.0	Temperature	22.6 C	2011-11-11T15:12:04Z (Network Time)
10-0:34.8.1	Humidity	29.2 RH	2011-11-11T15:12:04Z (Network Time)

3.8 MODBUS-SLAVE

Modbus-Slave mode can be activated by setting Mode=MODBUS-SLAVE under configuration->interfaces->RS485->options. This mode can be used, to transport specific MBUS or WMBUS data over modbus on specific requests and can be parametrized by these options:

SlaveAddr – which defines the RTU slave address for the gMUC (default: 01)
Format – defines the RTU format (default: 8N1)
Baudrate – defines the RTU baudrate (9600, 19200, 38400, default: 9600)

Should an invalid Baudrate be set, then the default value will be used. If any of these options were not used, then the corresponding option would be automatically use the default value.

To transport the specified data, first some 'Sensor'(s) can be defined. This can be done under configuration->meters->options. Meter can be marked as sensors, by setting the 'Sensor' parameter. This parameter definies the sensor number, which indirectly defines the address area for this sensor. Each Sensor value has a range of 100 register addresses. For example: Sensor=1 will be automatically mapped to register addresses 100-199, Sensor=2 will be mapped to register addresses 200-299, Sensor=3 will be mapped to register addresses 300-399 .. to a maximum of Sensor=64, which will be mapped to register addresses 6400-6499.
Sensor=0 is an invalid value. Register addresses 1-99 are used for system variables. Register address 1 is used for GPRS modem RSSI value, other register addresses of system variables are reserved for future use.

If there should be meters, which were not defined as sensor(s), they will be automatically initialized with the next free internal sensor-id. The internal sensor-id will not be reflected (saved) back, so that on each re-initialization the sensor-id for those meters can change. Only meters, which were marked with the 'Sensor' parameter will always have a constant sensor-id.

When the MODBUS-SLAVE driver was correctly defined, then the specified sensor data can be requested by using read holding register commands over modbus. In cases of specific errors (modbus exeption codes) of the request, appropriate exception responses will be sent.
The start address in the request of read holding register for sensors will be incremented by 1. So the requested adress 100 for example, will return the value of adress 101.

Write single register commando is supported and echos to any command that uses function code 06. The specified register address (0x7F7F) with the value 0xA55A will cause a system reboot.

Total status values can be read using read discrete input. To get these values, the sensors in the requested range must have been defined, otherwise an exeption response will be sent.

Some status values in the webui, have no value, but text. MODBUS-SLAVE definies specific values for these cases:

0x0000 – for Status "ok"
0xF000 – for Status "no reaction from meter,.."
0xFF00 – for all other pure text status values
0x00xx – for Status "error: .." (in case, there is a hexadecimal value after error:) xx stands for this hexadecimal value

3.9 Learn-Mode

The learn mode is used for automatic detection of not activated meters. Notice the following facts when using the learn mode:

<u>1107</u>

While the learn mode is active only **one** meter should be connected via RS485, otherwise there will be collisions on the bus and no data can be read out. This meter will be requested with an ‚empty' address. If the answer contains the real address it will be read out.
After detection of the meter, the learn mode has to be switched off.
Some 1107 meters do not support this type of request (empty address). In this case the meter has to be added manually.

<u>DLMS</u>

The DLMS meters of the manufacturer Sagem use a further protocol (CIASE). With this protocol the Sagem DLMS meters connected to the RS485 are detected. While detection, the meters recieve an MAC address, i.e. the learn mode is necessary for

the first start. To ensure this, add Learn=DLMS to the interface configuration (s. Figure 10). After a successful detection/activation of the new Sagem meter, the learn mode option has to be removed from the interface configuration.
The learn mode is also activated automatically on faulty DLMS requests and manually meter configuration for a short time.

The whole chain of the detection is described here:

1. Connection of the Sagem meter(s) over the RS485 interface
2. activation of the learn mode in the interface configuration (s. Figure 10)
3. wait for the detection of the new meter, check by refreshing the page Status – Meter, e. g.:

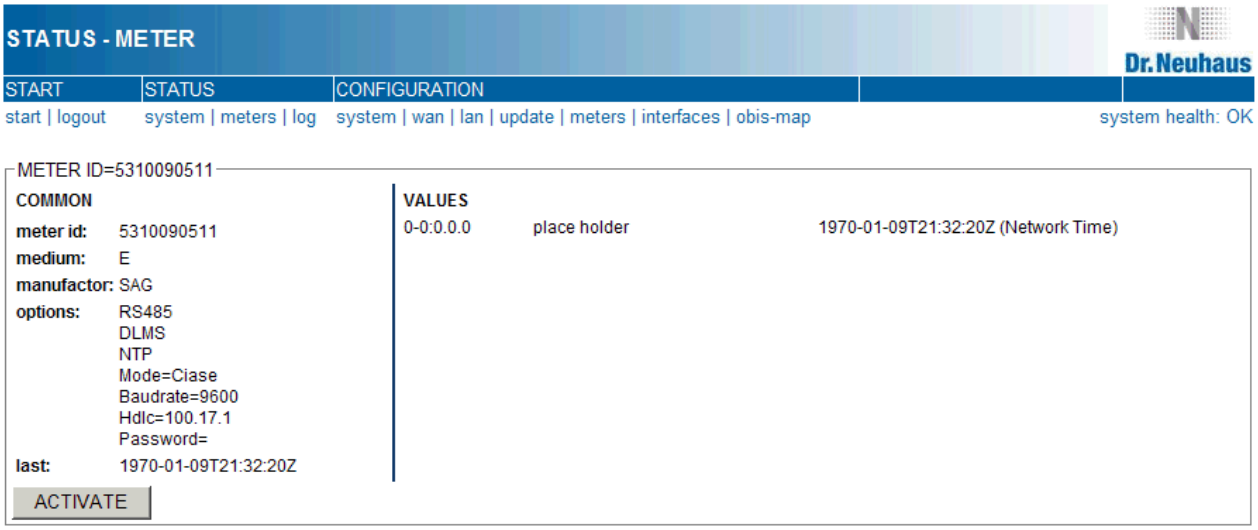


Figure 11: detected Sagem DLMS meter

The learn mode is now automatically deactivated

4. Activation of the new meter and adjustment of the logger on the page Configuration – Meter

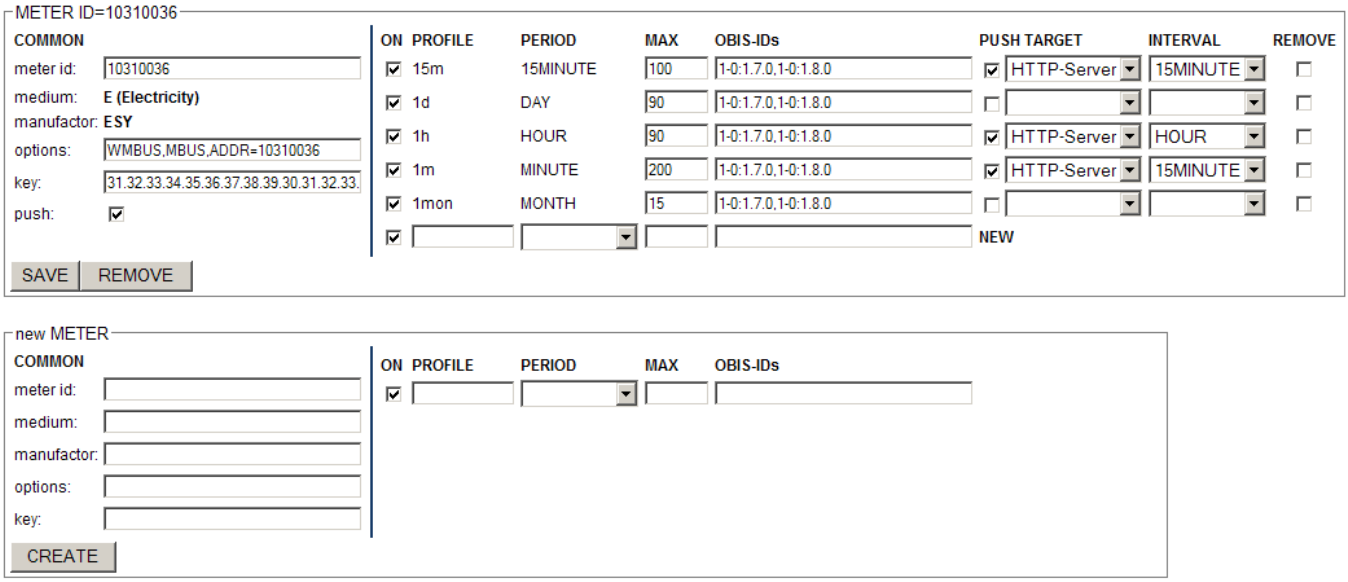


Figure 12: configuration of the new Sagem DLMS meter

the follwing OBIS-Ids are available:

- Power: 1-0:1.6.0
- Energy: 1-0:1.8.0

5. After the next request of the meter ist values are shown on the page STATUS\meter:

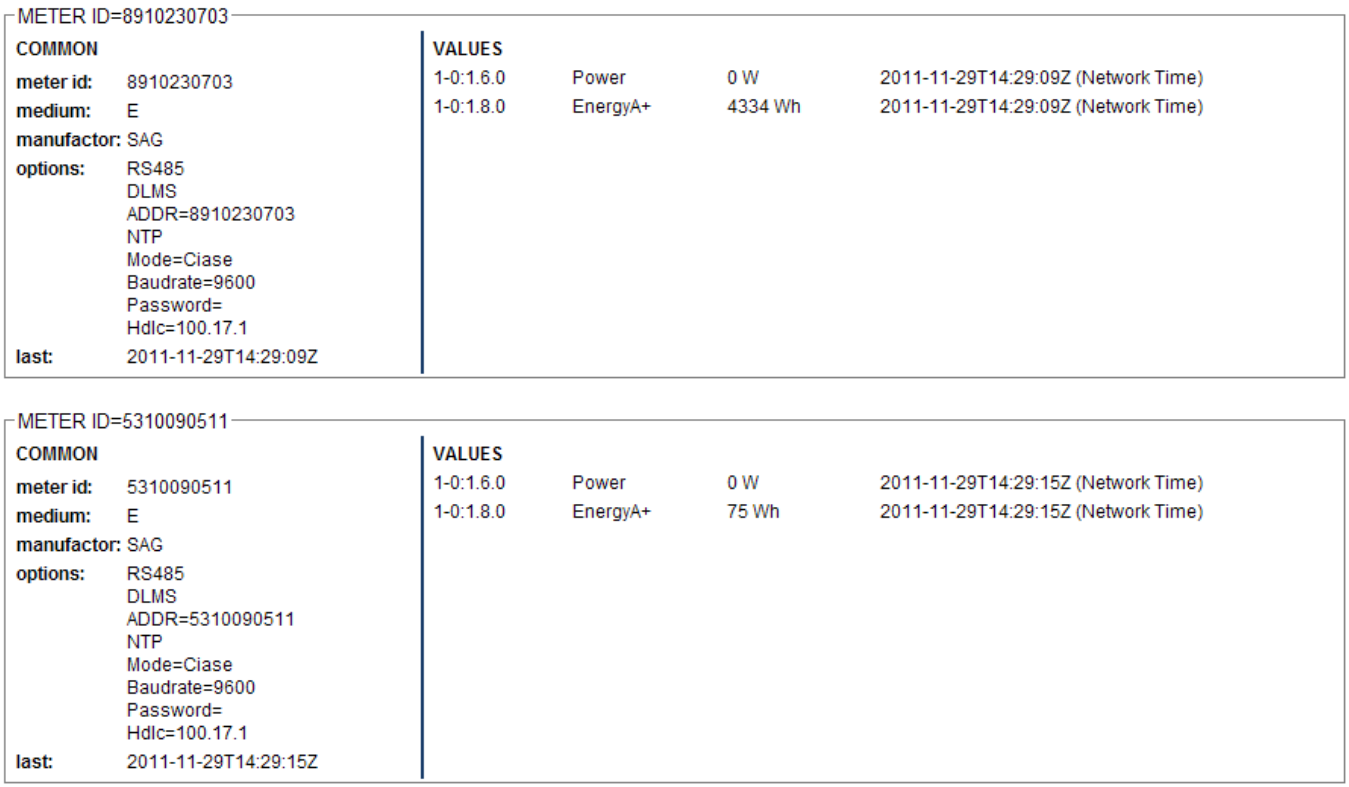


Figure 13: values of the new Sagem DLMS meter

6. deactivation of the learn mode in the interface configuration (s. Figure 10) by removing the option Learn=DLMS

3.10 Automatic Status-Output for wMBUS

The wMBUS status byte will be added as an extra measurement to the data record, before this record will be send to the logger profiles. This means, that each datapoint (in wMBUS) will have this additional (to other measurements) value of the status byte from the wMBUS telegram. It can be mapped similar to other dif/vif to obis combinations, but it uses/needs no dif/vif at all and has a hardcoded obisid representation F-F:F.F.F, so that only “Name” and “OBIS” have to be configured under obis-map.
The wMBUS status byte will be shown in webui under meter -> status for each wMBUS meter, also if it’s not configured. The following chapter “CHANGED”-Profile introduce a possible configuration to persist/log of this status value.

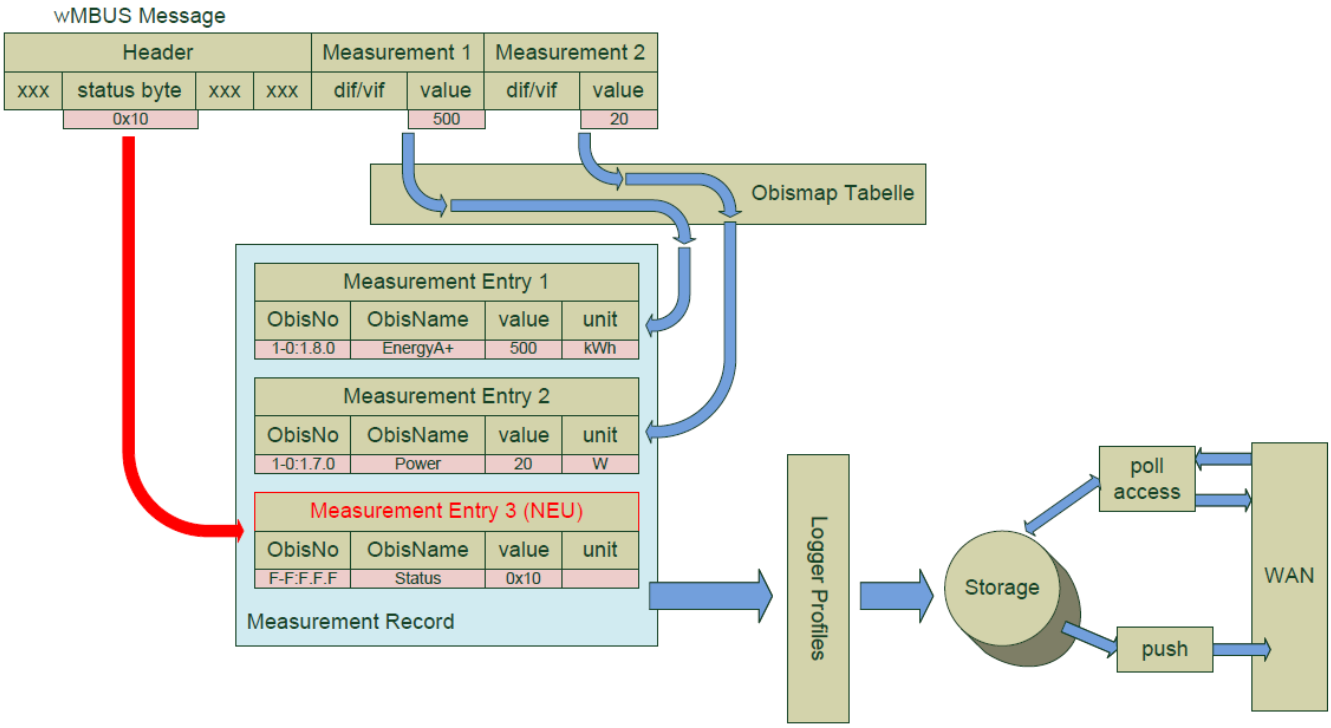


Figure 14: Status logging for wMBUS

3.11 “CHANGED”-Profile

This profile can be configurated for saving measurment values, which should be logged only on changes.

The “CHANGED” logger has no time trigger (intervall), so it’s directly triggered when current value is not equal to the last saved value.

The functionality of this logger, described on the example for logging status/error from wMBUS messages:

- a logger of type “CHANGED” is configured, that should save the obisid “F-F:F.F.F”
- this logger will save the sequential changes of the status byte and can be reached via push and poll on the WAN interface
- if this logger will be configurated with PUSH, for example with push interval MINUTE, so the PUSH will be triggered maximum once in a minute and would contains all changed values for this obis, obtained in this minute (plus possible old values which were not pushed previously – default PUSH functionality)
- a PUSH will only be triggered if the logged value has changed
- if there were no changes within the minute, then there will be no PUSH
- the PUSH trigger itself is time triggered (smallest interval = 1min)
- notice: the obisid “F-F:F.F.F” can also be used in context of a standard interval logger (so it would be saved, as “normal” measurement)

4 SECURITY

For safety reasons, there is an active firewall on the gMUC that routes only the following IP ports:

- 80 (http)
- 443 (https)
- 22 (SSH, SFTP)

This means, for example, that a gMUC does **not** respond to an ICMP (ping) query.

5 FORMATION RULES FOR W-MBUS ADDRESS

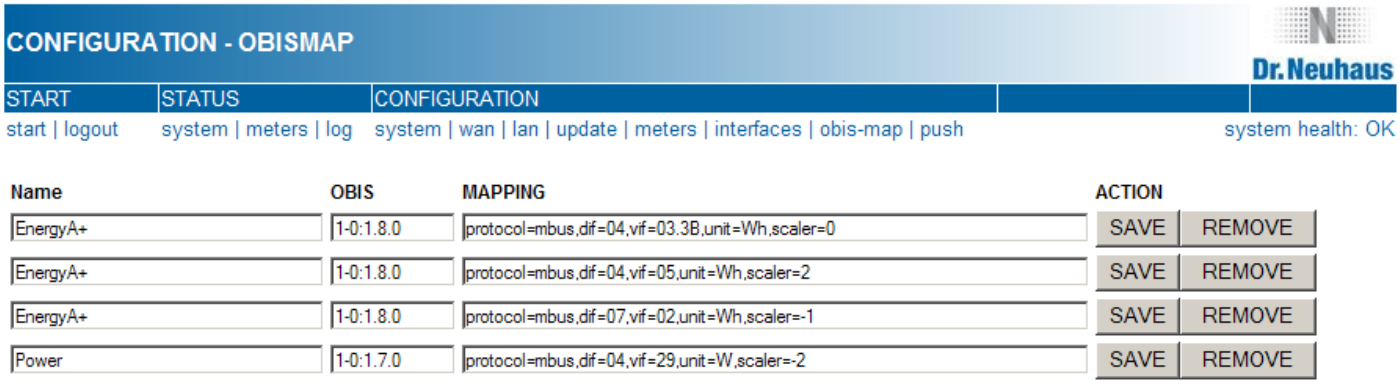
The meter address is read directly on the meter and used for the configuration. It must consist of 8 digits. If the address is shorter, it must be preceded by the corresponding number of zeros. The internal W-MBUS address is created on the basis of the medium/manufacturer/meter ID.

Example: 01.2D.2C.11.78.67.14.01.02 (internal WMBUS address)
Corresponds to: E/KAM/14677811

6 OBIS MAPPING

Inside the gMUC all meter data will be managed by a number OBIS number. This numbering system is for example in WMBUS protocol and MODBUS not supported. The DLMS protocol need additional parameters (attributes and class), that must be configured for a meter data query.
The mapping is done by specifying the protocol (*protocol=mbus,dlms,modbus*) and by special protocol parameters that lead to compliance with OBIS mapping to the specified OBIS number/name. When mapping, the unit (*unit*) and scaling (*scale*) of the measured value can be specified. The scaler is using the formula: *value = value * 10^{scaler}* applied to the measured value.

Mapping of a WMBUS meter:
For a OBIS number/name the corresponding Dif, Vif, parameters of the WMBUS protocol must be configured. These are specified in hexadecimal notation. e.g. dif=07,vif=03.3B By configuration of optional parameter „medium=“ and/or „meteraddr=“ it is possible to specify the mapping for an specific medium or meter.



Mapping of a DLMS meter:
For a OBIS number/name the corresponding class and attribute of the DLMS protocol must be configured.
e.g. class=0003, attribute=02.03

EnergyA+	1-0:1.8.0	protocol=dlms,class=0003,attributes=02.03	SAVE	REMOVE
Power	1-0:1.7.0	protocol=dlms,class=0003,attributes=02.03	SAVE	REMOVE
Power	1-0:1.6.0	protocol=dlms,class=0004,attributes=02.03	SAVE	REMOVE
Clock	0-0:1.0.0	protocol=dlms,class=0008,attributes=02	SAVE	REMOVE
Owner	1-0:0.0.0	protocol=dlms,class=0001,attributes=02	SAVE	REMOVE
Owner	0-0:42.0.0	protocol=dlms,class=0001,attributes=02	SAVE	REMOVE
unknown DLMS	0-0:0.0.252	protocol=dlms,class=0003,attributes=02.03	SAVE	REMOVE

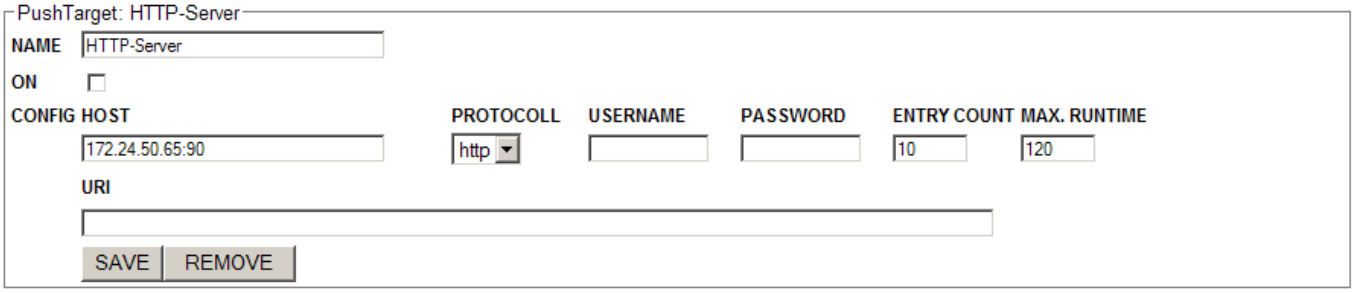
Mapping of a MODBUS Sensor:

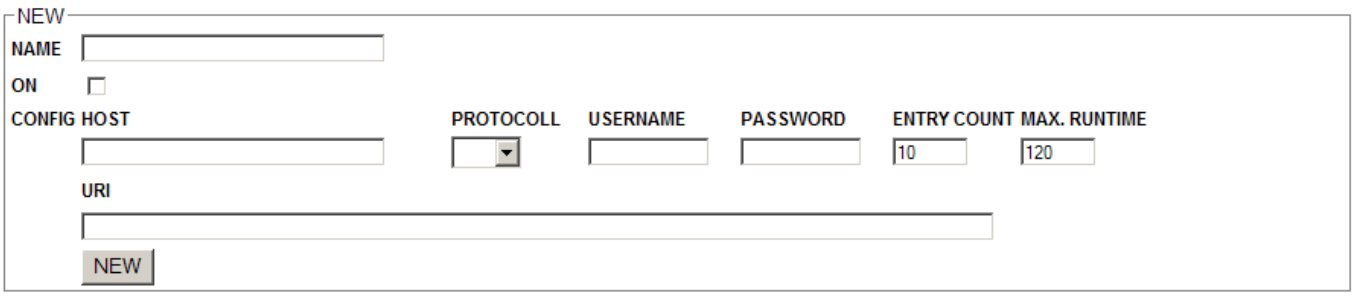
For a OBIS number/name the corresponding bus-address of the sensor and the MODBUS register with specification of function (HR - holding register, IR - input register) and start address must be configured. e.g. meteraddr=1,register=HR:2

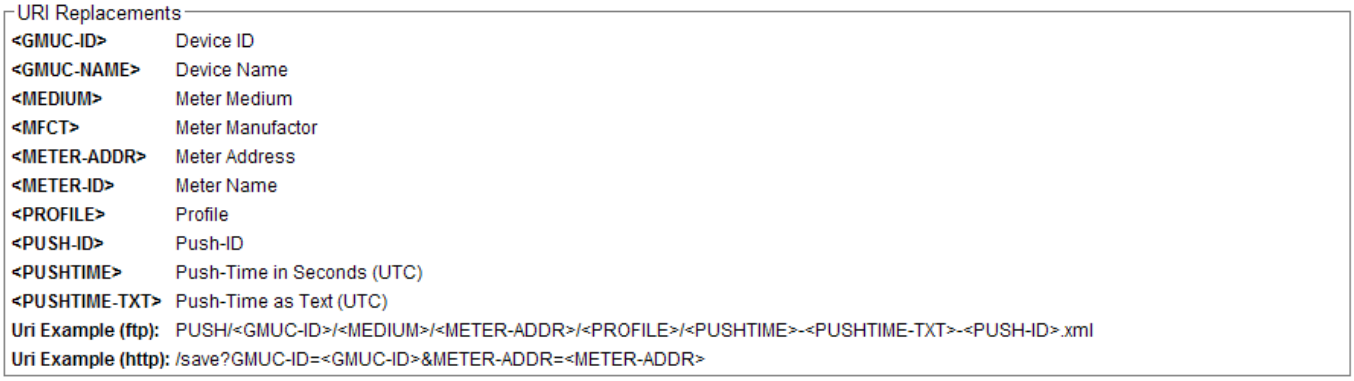
ADC-0	10-0:32.8.0	protocol=modbus,meteraddr=3,register=HR:0,unit=digit,scaler=0	SAVE	REMOVE
ADC-1	10-0:32.8.1	protocol=modbus,meteraddr=3,register=HR:1,unit=digit,scaler=0	SAVE	REMOVE
Voltage	10-0:33.8.0	protocol=modbus,meteraddr=2,register=HR:0,unit=V,scaler=-2	SAVE	REMOVE
Current	10-0:33.8.1	protocol=modbus,meteraddr=2,register=HR:1,unit=A,scaler=0	SAVE	REMOVE
Temperature	10-0:34.8.0	protocol=modbus,meteraddr=1,register=IR:0,unit=C,scaler=0	SAVE	REMOVE
Humidity	10-0:34.8.1	protocol=modbus,meteraddr=1,register=IR:2,unit=RH,scaler=0	SAVE	REMOVE

7 PUSH

The Push page configured the Push jobs of the gMUC. The Push feature will be periodically sent meter data from the gMUC to an FTP or HTTP server. The transmitted data is sent in XML structures. Using FTP Push, a XML file will be sent to the FTP server. Using HTTP Push, the same XML data will be sent as content of the html file. The push XML data structures are described in the document *gMUC_XML_Interface_vEN.doc*.







Configuration of an push target:

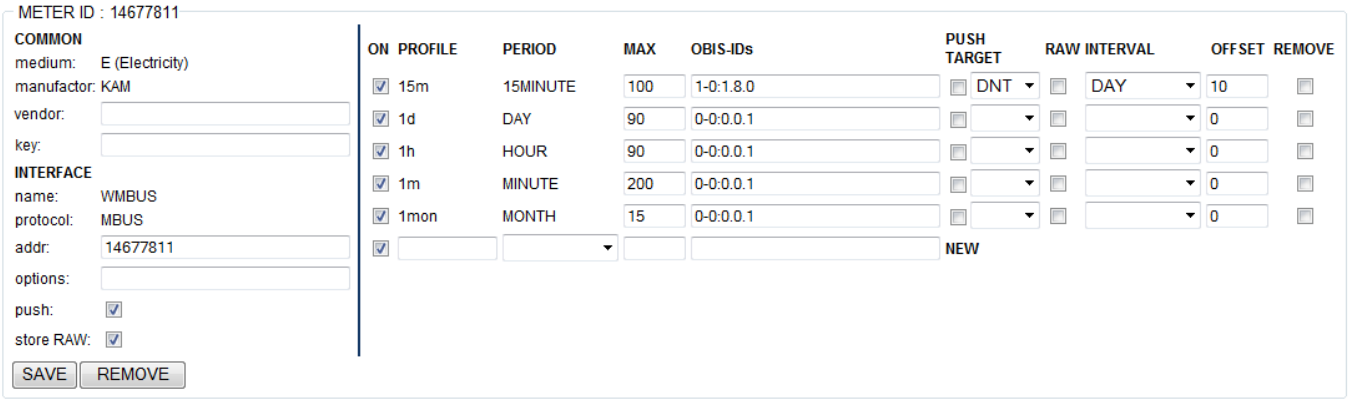
NAME	symbolic name of the PUSH target, using for referencing on meter configuration
ON	global activation/deactivation of the Push target
HOST	DNS-Name or IP- address of the Push servers with port number
PROTOCOLL	FTP or HTTP
USER/PASSWORD	Client authentication of the Push server (optional)
ENTRY COUNT	Maximum number of measurements in one push packet, this value determines the max. XML file size of a single push.
MAX. RUNTIME	Push Timeout in seconds

For the configuration of the URI (FTP file name, HTTP query string) wildcards are available with which one can realize a dynamic run-time implementation. The configuration of the URI is optional and must be coordinated with the server. When you push the FTP directory, the structure of the given file name on the server is automatically created.

<GMUC-ID> <GMUC-NAME>	gMUC: Device ID / name
<MEDIUM> <MFCT> <METER-ADDR> <METER-ID>	Meter: medium / manufacturer / address / ID
<PROFILE>	Data Logger Profile (1m, 15m, 1h, 1d, 1mon)
<PUSHTIME> <PUSHTIME-TXT>	Push time: second / Text

In the meter configuration, each logger profile will be assigned to a push job. Is this configured, the meter data of this logger will be pushed to the corresponding push target. The push interval of a logger can be configured individually. It need not be identical to the recording interval (period). E.g. In the example below, the 15 minute values are pushed all hours. In the corresponding XML files you will find 4 data points.
To the push interval a random offset time in minutes can be configured. I.e. Push the actual time is a random time offset between 0 .... Offset added to it. Thus, a load distribution for the push servers are achieved when using many of the same push gMUC's interval and push server. The offset can have a maximum size of the push interval of the logger, but not greater than 300 minutes.
The Push of every meter can be enabled / disabled → loggers across. It is also possible to enable/disable the push for every single logger (check box).
If the checkbox *RAW* enabled, the raw protocol data (undecoded) received from the meter will be append to the XML data structures.

Push logger configuration of a meter



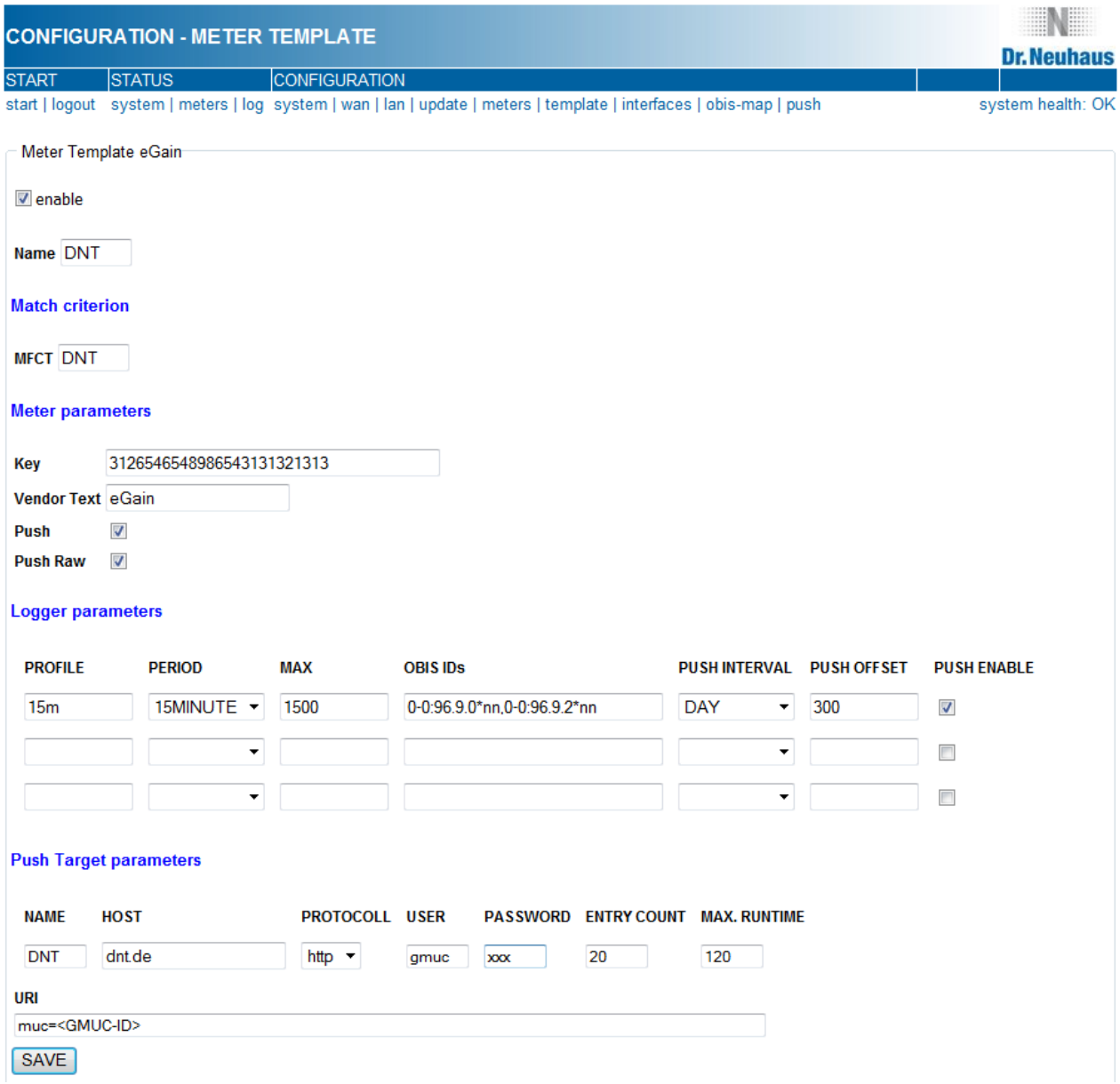
Comment:
When using the FTP protocol (http://en.wikipedia.org/wiki/Ftp), the passive mode is used. The EPSV command will be used for that. The gMUC initiated all TCP-connections to the FTP Server.

8 AUTOMATIC METER CONFIGURATION AND ACTIVATION

In the gMUC, a meter template can be configured for automatically activating and configuration of meters → Plug und Play.
In the meter template are all necessary parameters for the
- Meter configurations (manufacturer ID, Key, ...)
- Logger configurations (period, Obis number, count, push, ...)
- Push target configurations (host, protocol, ...)

stored, which are necessary for operation in the gMUC.
The template can be configured via the Web configuration page *CONFIGURATION/template* or via the *XML/setconfig* interface.
A selected template is always used internally in gMUC when
1. a meter data packet can't be assigned to any activated meter
   and
2. the configured manufacturer-ID (MFCT) of the template matches with the meter manufacturer-ID of the received data packet.

In this case a new meter will be configured and activated in the gMUC. All necessary meter parameters be used from the meter data packet (meter number) as well as from the template (logger configuration, push configuration).
Furthermore, a push target is created and/or configured when to corresponding entries are available in the template. This Push target is linked internally to the new meter.



9 APPENDIX

9.1 List of abbreviations

Abbreviation	**Meaning**
APN	Access Point Name
DHCP	Dynamic Host Configuration Protocol
DLMS	Device Language Message Specification
DNS	Domain Name System
DynDNS/DDNS	dynamic Domain-Name-System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IP	Internet Protocol
LAN	Local Area Network
gMUC	Multi Utility Gateway
NAT	Network Address Translation
NTP	Network Time Protocol
PIN	Personal Identification Number
PPPoE	Point-to-Point Protocol over Ethernet
SIM	Subscriber Identity Module
STUN	Session Traversal Utilities for NAT
WAN	Wide Area Network
MBUS / M-Bus	wired Meter Bus
WMBUS / wMBUS	wireless Meter Bus

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Dr. Neuhaus Telekommunikation GmbH

Papenreye 65

D-22453 Hamburg

Germany

Internet: http://www.neuhaus.de

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